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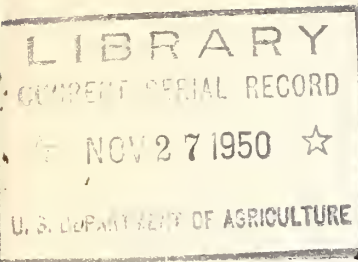


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SOME RESULTS OF POULTRY RESEARCH  
at the

Agricultural Research Center, Beltsville, Md.

(Taken from the 1949 Chief of Bureau Report)

Outbred, crossbred, and hybrid chickens compared

Several methods of breeding for the improvement of egg production are being compared at Beltsville. These breeding methods include outbreeding, crossbreeding, and the crossing of inbred lines (hybridization). The different methods of breeding are being applied to Rhode Island Reds and White Leghorns. Data obtained in the last 2 years are summarized in the following list. The lower production indicated for the years 1947-48 was due to an outbreak of Newcastle disease in the flocks at Beltsville.

Breed of birds and nature of breeding:	Annual average egg production during—	
	1946-47	1947-48
Outbred Rhode Island Red males x outbred		
Rhode Island Red females-----	219.0	198.6
Outbred Rhode Island Red males x outbred		
White Leghorn females-----	228.8	208.1
Inbred Rhode Island Red males x inbred		
White Leghorn females-----	238.9	230.0
Outbred White Leghorn males x outbred		
Rhode Island Red females-----	250.0	239.9
Inbred White Leghorn males x inbred		
Rhode Island Red females-----	255.3	240.1
Outbred White Leghorn males x outbred		
White Leghorn females-----	220.7	182.3

The levels of production for these 2 years are the highest thus far obtained by any of the methods of breeding used with the exception of the outbred stock. It appears that the crossbred progeny of White Leghorn males are doing about as well as the incrossbred progeny sired by the inbred White Leghorn males. The production of both crossbred and hybrid groups sired by the White Leghorn males is considerably higher than that of similar groups sired by the Rhode Island Red males. The production of the incrossbreds and crossbreds is considerably higher than could be expected from the average pullet. The problem still remains of finding out whether or not both the incrossbred and crossbred progeny sired by Leghorn males can maintain or increase this high average production.

### Factors that affect keeping quality of eggs

The percentage of thick albumen is an important factor in determining the quality of an egg. Nine years of selection and breeding at Beltsville have resulted in the development of two lines of White Leghorns which lay eggs differing materially in the durability of the thick albumen. Eggs from one line have a type of thick albumen which slowly breaks down to thin albumen. This line has been called the "heat-resistant" line. Eggs from the other line are quite the reverse, the thick albumen rapidly deteriorating to thin albumen. In recent tests, eggs from both lines were kept at a temperature of 100° F. at a constant humidity for 14 days to test their resistance to heat. After this time the heat-resistant eggs had approximately 60 percent thick albumen, more than three times as much as the 18 percent remaining in the non-heat-resistant line.

Eggs from the heat-resistant line stored at a temperature of 30° F. for periods of 6 and 12 months were definitely superior to non-heat-resistant eggs and to eggs laid by unselected hens. All eggs were handled and stored under identical conditions. Shell quality, an important factor in the keeping quality of storage eggs, was practically the same for the eggs laid by both lines.

### Breeding to improve meat quality in chickens

Dark Cornish and New Hampshire hatching eggs were purchased in 1946 from several different breeders in order to start a project on the improvement of carcass quality of poultry, particularly breast development. The Cornish breed was chosen for wide breasts and generally superior carcass quality and the New Hampshires for early, rapid growth and feathering, high egg production, fertility, and hatchability. The best individuals in both breeds from a meat-production standpoint were chosen as breeders for the 1947 matings.

The breast angles of the progeny were measured and recorded. The male progeny of the Dark Cornish in 1947 had an average angulation of 49.9°, and the females 49.2° at 12 weeks of age. By progeny-test methods of breeding the breast angle of the 1948 Dark Cornish at 10 weeks of age was increased to 53.5° for the males and 52.2° for the females. It is a well-known fact that 10-week-old chickens have poorer breast development than 12-week-old chickens so that the improvement was actually greater than the figures indicate. These increases of 3 and 3.6° represent a considerable improvement of breast development at this early age.

There were similar increases in the breast development of the New Hampshire progeny. In 1947 the males had an average breast angulation of 44.6° and the females 43.6° at 12 weeks, whereas in 1948 the males at 10 weeks had an average of 47.6° and the females 47.8°. The breast development of the 1948 New Hampshires closely approximated that of the 1947 Dark Cornish